**Genetic Drivers of Human Plasma Metabolites That Determine Mortality in Heart Failure Patients with Reduced Ejection Fraction**

Vandana Revathi Venkateswaran1, Ruicong She 2, Hongsheng Gui 1, Jasmine A. Luzum1,3, Timothy D. Bryson 1, Zack E. Malouf 4, L. Keoki Williams 1, Hani N. Sabbah 4, Stephen J. Gardell 5, David E. Lanfear 1,4

1Center for Individualized and Genomic Medicine Research, Henry Ford Hospital, Detroit, MI;

2Department of Public Health Science, Henry Ford Health, Detroit, MI;

3Department of Clinical Pharmacy, University of Michigan College of Pharmacy, Ann Arbor, MI;

4Cardiovascular Division, Department of Medicine, Henry Ford Hospital, Detroit, MI;

5Translational Research Institute, Advent Health, Orlando, FL.

**Supplementary Material:

Table S1:** List of metabolites (8 OAs, 23 AAs, and 57 ACs) on which targeted metabolite profiling was measured using plasma samples**:**

 **Organic Acids**

|  |  |
| --- | --- |
| **Type** | **Metabolite** |
| OA | Lactate |
| OA | Pyruvate |
| OA | 3-HBA |
| OA | Succinate |
| OA | Fumarate |
| OA | Malate |
| OA | a-KG |
| OA | Citrate |

**Amino Acids**

|  |  |
| --- | --- |
| **Type** | **Metabolite** |
| AA | 1-MethylHistidine  |
| AA | 3-MethylHistidine  |
| AA | Alanine  |
| AA | Arginine  |
| AA | Asparagine  |
| AA | Aspartate  |
| AA | Citrulline  |
| AA | Glutamate  |
| AA | Glutamine  |
| AA | Glycine  |
| AA | Histidine  |
| AA | Isoleucine  |
| AA | Leucine  |
| AA | Lysine  |
| AA | Methionine  |
| AA | Ornithine3  |
| AA | Phenylalanine  |
| AA | Proline  |
| AA | Serine  |
| AA | Threonine  |
| AA | Tryptophan  |
| AA | Tyrosine  |
| AA | Valine  |

**(C) Acyl Carnitines**

|  |  |
| --- | --- |
| **Type** | **Metabolite** |
| AC | C2 |
| AC | C3-DC |
| AC | C3 |
| AC | C4 Butyryl |
| AC | C4 Isobutyryl |
| AC | C4:1 |
| AC | C4-DC Methylmalonyl |
| AC | C4-DC Succinyl |
| AC | C4-OH |
| AC | C5 2-Methylbutyryl |
| AC | C5 Isovaleryl |
| AC | C5 Valeryl |
| AC | C5:1 |
| AC | C5-DC |
| AC | C5-OH |
| AC | C6 |
| AC | C6-OH |
| AC | C8:1-OH |
| AC | C8 |
| AC | C8-OH |
| AC | C10 |
| AC | C10-OH |
| AC | C12:1 |
| AC | C12 |
| AC | C12-OH |
| AC | C14:1 |
| AC | C14:1-OH |
| AC | C14:2 |
| AC | C14:2-OH |
| AC | C14 |
| AC | C14-OH |
| AC | C16:1 |
| AC | C16:1-OH |
| AC | C16:2 |
| AC | C16:2-OH |
| AC | C16 |
| AC | C16-OH |
| AC | C18:1 |
| AC | C18:1-OH |
| AC | C18:2 |
| AC | C18:2-OH |
| AC | C18 |
| AC | C18-OH |
| AC | C20:1 |
| AC | C20:1-OH |
| AC | C20:2 |
| AC | C20:2-OH |
| AC | C20:3 |
| AC | C20:4 |
| AC | C20 |
| AC | C20-OH/C22:6-DC |
| AC | C22:1 |
| AC | C22:2 |
| AC | C22:3 |
| AC | C22:4 |
| AC | C22:5 |
| AC | C22 |